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# Inside out: knowledge brokering by short-term policy placements

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**Key words:** knowledge broker, policy placement fellow, institutional embedding, policy impact

## Abstract

The evidence-policy interface is important for delivery of sustainable development policy. We examine one specific form of knowledge brokering, the temporary placement of academic research scientists in UK policy arenas. We argue that successful knowledge brokerage depends on establishing social processes critical to effective knowledge exchange. Merely facilitating proximity of academic and policy actors is insufficient. Cultural understandings are key conditions for knowledge brokerage in this context. Academics who are outsiders to the policy process need to become credible insiders in order to be effective in bringing an outsiders perspective into play.

## Background

### *Research and policy impact*

Interest in creating impact from research has strengthened over several decades. Scientific collaborations between policy and academia increased during the 1970s and 80s (Denis & Lomas 2003). The need for effective science-policy interfaces became even more important in the face of the 'perfect storm' of climate change, resource depletion and food insecurity (Foresight, 2011). In the UK a further driver is the inclusion of 'impact' as a quality criterion in university research department quality assessment (REF 2014<sup>1</sup>).

Sustainable development (SD) is a particularly challenging context in which to consider policy impact. A Thomson Reuters Web of Science publications database search of article titles including the term 'sustainable development' from 2000-2015 revealed that SD is a concept employed by a vast range of experts and practitioners. For example, SD principles are considered in articles on hydrogeology, climate change, transport, steel-making, building design, energy, mining, education, food security energy and SD policy instruments. SD publications also cover a wide scalar range, from the modelling of blast-furnace operations to global population issues. Moreover, these diverse directions suggest a high degree of interdisciplinary and transdisciplinary policy and evidence activity (e.g. Brandt *et al.* 2013, Simon & Schiemer 2015). Although not all of this SD research activity aims to deliver knowledge at the policy interface, there is clearly a major challenge to find effective mechanisms that direct SD evidence into the policy world.

The complex, value-laden and uncertain nature of SD has led to an emphasis on stakeholder involvement as key to the production of robust knowledge (Lang *et al.* 2012, Cornell *et al.* 2013, Hedlund-de Witt 2014). Less attention has been paid to how this knowledge informs policy and it is this latter aspect that forms the focus of this paper.

One potential method for SD research to reach policy makers is through placement fellowships in policy settings. A UK Council for Science & Technology report (2008) recommended that to improve science-policy interactions, secondment and internship mechanisms should be developed. This mechanism was re-iterated in guidelines for policymakers under the open policy framework (Government Office for Science 2013). Placement fellowships also facilitate useful opportunities to test a number of theoretical assumptions on the manner in which relationships and social processes might influence knowledge exchange. For example, person-to-person engagement emerges in the literature as a key ingredient for effective knowledge dissemination and uptake (Mohrman *et al.* 2001, Rynes *et al.* 2001, Phillipson *et al.* 2011), perhaps because the close proximity of researchers and policymakers can facilitate research-informed policy decisions (Laycock 2000). In this paper, we seek to examine the knowledge brokerage processes undertaken by academics placed temporarily into policy environments. We draw on our strengths as policy hosts (O’Callaghan) and former placement fellow (Bruce) as well as on empirical evidence. We begin by reviewing the knowledge brokerage landscape, before introducing our methods for collecting empirical evidence. We then present our findings and discuss the implications of short-term policy placements for effective knowledge exchange. Our empirical insights suggest that merely co-locating scientists and policy makers is insufficient to bring about effective knowledge exchange. However, the social processes begun in these placements can result in longer term impacts. We conclude by suggesting some avenues for further research.

### ***The knowledge brokerage landscape***

Many barriers have been identified in an extensive literature on the conditions and factors affecting knowledge exchange between academia and policy-makers. Relevant barriers include, the fast pace of policy work (Campbell *et al.* 2007), underutilisation of existing research knowledge that accumulates ‘on the shelf’ (Choi *et al.* 2005) and the publication of findings in locations inaccessible to policy makers (Moncaster *et al.* 2010). Much research stresses the different cultures between academe and policy (e.g. Brownson *et al.* 2006, Clark & Holmes 2010).

Although the science-policy interface has been viewed as a space for knowledge acquisition by decision-makers (Michaels 2009), knowledge exchange and uptake is a “social process” often requiring personal contact (Nutley *et al.* 2007:88) and trust (Mitton *et al.* 2007, Council for Science & Technology 2008, Harris & Lyon 2013). Therefore, placement fellowships might be anticipated to facilitate effective knowledge brokerage through the creation of a direct pathway for knowledge flow between key actors, providing an interactive space in which these social processes may unfold and develop.

Knowledge brokers may have a range of functions such as informing, consulting, matchmaking, engaging, collaborating and capacity building (Michaels 2009). Sebba (2013) distinguishes between facilitating connections and communicating research. Placement fellows could be considered as temporarily holding “complex brokerage roles” which allow them to “penetrate the workings of both the policy and the research system” (Kogan *et al.* 2006: 20). These fellows may understand the research system but their complex brokerage roles require them to retain their academic independence while they penetrate the workings of a system whose processes are situated within an established public policy context.

We view placement fellows as undertaking knowledge brokerage in specific, situated interactions (Currie & White 2012). However, in contrast to Currie & White, these interactions do not take place in the context of shared, day-to-day professional practice, such as in medical teams. There is no shared

‘professional practice’ between academic researchers and policy practitioners, although they may share some of the knowledge base.

This paper uses the experiences of placement fellows to examine knowledge brokerage processes. Placement fellowships are usually short-term (3-24 months) and take place either full-time or part-time. A number of different schemes exist. The Centre for Science and Policy at Cambridge University (CSaP)<sup>2</sup> creates policy to academia fellowships; the Natural Environment Research Council (NERC)<sup>3</sup> placement schemes put academia into government, and a similar scheme was run by the Economic and Social Research Council (ESRC). The Rural Economy and Land Use (Relu)<sup>4</sup> Programme used work-shadowing to improve knowledge exchange (Phillipson *et al.* 2011).

Although the roles of internal evidence specialists within healthcare organisations (Chafe and Dobrow 2008), consultants (Sin 2008) and outsiders recruited into Whitehall (Levitt and Solesbury 2005) have been examined, to our knowledge this paper is novel in relating specifically to placement fellowships. We contribute empirical evidence to the current mainly theoretical knowledge base on use of scientific expertise in policy (Sprujit *et al.* 2014).

We examine placements undertaken within the Placement Fellowship schemes used by the Research Councils in the UK. These placements are an underexplored method of knowledge brokerage and provide ready-made opportunities to test out some of the proposed limitations to knowledge exchange and evidence-informed policy established in the literature. Placement fellowships aim to improve knowledge exchange by improving understanding between the research and policy communities. We argue that the institutional embedding is necessary, but insufficient, for effective knowledge brokerage. In the specific context of short-term policy placements, social relationships and cultural understandings are key to effective knowledge flow. Academics who are outsiders to the policy process need to become sufficient insiders to be credible, in order to be effective in bringing an outsiders perspective into play. We present an initial empirical study and conclude by offering some suggestions towards further research on knowledge brokerage in short-term policy placements.

## Methods

Empirical data were obtained from a one-day, structured, elicitation workshop with 14 people held in London in June 2010, and 11 semi-structured interviews, six of which were conducted September – October 2010 (interviews A to F) and a further five during August 2015 (interviews G to K). The interactions sought to identify what knowledge exchange took place during the placements and to understand how such exchange was brought about (the interview schedule can be found in Annex 1). The repeat sampling allowed progress and changes in use of placements to be taken into account. In total, the sample included 17 academics who had undertaken placements in policy environments, five policy hosts and three funders of fellowships. There was, however, some duplication in that one of the academics undertaking a placement was also subsequently a funder, and one policy host subsequently undertook a placement in academia. The academics included natural scientists and social scientists. Policy placements covered a range of different UK Government (including devolved administration) policy areas, including environment, wellbeing, health and scientific research functions, in five different departments. All fellows participating were involved in aspects of sustainable development evidence or policy work, for example on environment, energy, wellbeing or resource use. Specific locations of fellows are not provided to maintain anonymity, given the very small number of such fellowships (for example the UK Natural Environment Council lists three fellows in policy placements at the time of writing). The repeat sampling was necessary to have sufficient numbers of interviews to achieve

thematic saturation, the time gap reflected the exigencies of research. Although individual policies may have changed during this period, our focus was on knowledge brokering processes which we understand as remaining broadly similar during this period. All quotes are from individual interviews, data from the elicitation workshop is considered as a product of the workshop group rather than individual participants, and is therefore not suitable for quotation.

Participants for the interviews and workshops were identified using web searches, information from Research Councils and other knowledge exchange events, and snowballing from the initial contacts. The elicitation workshop was facilitated and detailed notes were taken by a dedicated member of the research team. Semi-structured interviews were all conducted over the telephone by Bruce. After explaining the purpose of the interview, consent was sought to record the interviews with anonymity offered. Interviews lasted for 45-60 minutes and focussed around understanding the nature of the fellowship, followed by general themes around gains and challenges of the fellowship, in particular probing different aspects of knowledge exchange and finally asking respondents to reflect what they would have done differently given hindsight. The workshop activities focussed around similar themes to the interviews. Following an initial icebreaker exercise, the workshop sought to elicit what knowledge was being exchanged and specifically what changed as a result of the placement, then challenges were examined and finally the impacts of the placements beyond the immediate placement period were explored. Transcripts were coded and analysed thematically by Bruce, again with focus on knowledge exchange processes. A separate report was produced from the workshop but as the emerging themes showed strong similarity with interviews, data were pooled. Our analysis is informed by our first-hand experience of such placements as hosts (O'Callaghan) and in undertaking such a placement (Bruce) and we draw on our respective understandings of the policy and academic worlds to reflect on the results from our research.

## **Findings**

In contrast to much of the literature on knowledge brokerage, these placements were not career knowledge brokerage positions (Knight and Lightowler, 2010, Chew and Martin 2013, Turnhout *et al.* 2013) or in institutional knowledge brokerage settings (Currie and White 2012, Kislov *et al* 2015). Each fellow had responded to an advert for a short-term policy placement position. The placements varied in format. Some involved clearly defined, research-oriented projects that required data analysis for a specific purpose. Others were clearly defined but related more explicitly to improving knowledge exchange processes rather than focussing on one area of research. Some placements were in fast-moving policy areas, where both civil servants and fellows needed to move quickly from one area of work to another. A few (the most unsatisfactory from a knowledge brokerage point of view) were totally undefined posts. Two fellowships were in senior positions with clear remits to provide frameworks for further work, although most fellows were academics at earlier career stages.

Placements were mostly part-time (20%-80% full-time equivalent) with one full-time placement. Fellowships were three to 24 months in length, although four of the fellows interviewed had the original length of their placements extended. All fellows interviewed had either retained their academic posts or have returned to them, although in two cases there was evidence of undertaking sequential knowledge brokerage placements in different locations. Fellows were usually appointed to placements as individuals, although in some cases more than one individual was on placement in the same department at the same time. There was, however, little evidence of fellows working as teams.

We begin by highlighting how our respondents related to the policy world, how they needed to be able to cross the cultural barrier between research and policy making. We then explore the knowledge brokerage functions in more detail, examining knowledge management, linkage and exchange, and capacity building (Ward *et al.* 2009) models in turn. We then take the perspective of the placement fellow, their role ambiguity and career trajectories.

### ***Interacting with the policy process***

One of the key reasons given by respondents for undertaking policy placements was to learn more about the policy process, and to gain an understanding of how policy-making works. Contrary to Phipps & Morton (2013) we found strong evidence of a culture gap between policy makers and placement fellows in terms of each other's working contexts. As an example, one interviewee experienced the move from an academic to a policy culture so strongly that it was "mind blowing" (interview K, 12 month placement), capturing the depth of challenge. Even a senior respondent who had prior experience of academia and policy, expressed surprise at the extent of those differences. We found similar surprise expressed by a policy maker undertaking a placement in academia. These findings go beyond the different timescales, reward structures and languages identified by others (Brownson *et al.* 2006, Clark & Holmes 2010), highlighting the challenge of navigating the day-to-day processes within which the fellows were expected to undertake knowledge brokerage activities. This included learning how policy makers talk and developing the capacity to see through official language. This practice-based knowledge was seemingly a precondition to further knowledge brokerage activities. Having recognised the importance of overcoming cultural barriers, we identified what we term 'process knowledge' in Table 1. Process knowledge equips fellows to become part of the policy making environment and be able to undertake effective knowledge brokerage.

[table 1 around here]

Fellows expressed their surprise at the range of factors alongside scientific evidence that influenced the policy process. Conversely, the ability of academics to identify policy relevant questions was challenged by a policy respondent "*in academia they tend to identify problems which they think are policy relevant, but are not necessarily policy relevant*" (interview F policy placement in academia and policy host). Academic respondents spontaneously acknowledged they had a very simplistic view of how evidence is used in policy before their placements e.g. "*it rapidly became clear to me that it was just one form of evidence, if you like, that feeds in alongside other forms of evidence. And it really wasn't particularly high up that hierarchy*" (interview B, 9 month placement). The suggestion here is that there is no inevitable linear pathway from research evidence to policy practice, as fellows formerly presumed. Interviewees suggested that brief placements may not give sufficient cross-cultural exposure to become effective knowledge brokers. Fellows who had undertaken longer placements felt that the cultural learning curve continued for up to six months, but with longer placements (e.g. 18 months) there was a danger of becoming habituated to the policy culture and losing the academic perspective.

We identified considerable process knowledge exchange, particularly around motivations, working styles and the constraints under which both policy makers and academics function. The close proximity of academics and policy makers meant that the academics could learn a new style of working within a different set of constraints. The process was described by many of our interviewees as that of partly becoming an insider; one described this as "joining the club". The fellows, to a greater or lesser extent, learned how to behave as part of the policy making community, how to work in it and achieve what is required, and in doing so, gaining the trust of the policy community. They formed a cadre of academics who learned by practice how to participate in the policy world. They could be conceived of as an

incipient Network of Practice (Brown & Duguid 2001) who understand the cultures of academia and policy and are able to bridge the culture gap. However, this network remained incipient as there are few formal mechanisms for maintaining links between policy makers and former fellows, or to link fellows together (although NERC undertakes networking events for knowledge exchange fellows).

A second key issue for knowledge brokerage was identified. Fellows were placed at different levels in the civil service hierarchy. As well as personality issues, this raises questions of whether the appropriate level of policy person is being interacted with. Some respondents thought there was a limit on the extent to which the evidence they provided was able to penetrate up the hierarchy, and have impact on policy. .

Academics highlighted the benefits from placements of developing wider networks beyond the immediate policy community, such as other stakeholders and international policy communities or invitations to expert workshops. Similarly the policy hosts stressed their enhanced access to academic networks and enhanced ability to get information directly from academics. But since policy makers frequently move between posts, fellows found it difficult to maintain personal links in the longer term.

The brokerage role envisaged by placement fellows often included challenging the existing policy paradigms e.g. *“the knowledge exchange is basically educating people ... that ... [there] is a different way of thinking, is a different method and that there are other ways that you could use”* (interview D, 6 month senior placement). The desire to reframe the policy arena was common among our respondents but policy makers were often not receptive. Respondents expressed three different viewpoints on this conceptual shift. One view (from both academic fellow and policy host perspectives) was that challenging the established way of thinking could be very unwelcome, unproductive and ultimately unsatisfactory for all involved. Our sample included two cases where this had clearly happened. In a second view (from academic fellow perspectives), where policy makers were grappling with a novel area, knowledge on a novel way of thinking was particularly welcomed. We had one example among our respondents where this had occurred. This could be explained as developing capacity in a new area, or it could be that little polarisation in the knowledge area had so far developed. The third view (from academic fellow perspectives) was that the ability to challenge policy makers in an appropriate way was subject to first understanding the policy world and its constraints before earning the right to challenge existing knowledge. As noted by one interviewee *“I came into it thinking policy makers have got it all wrong, I’m now more balanced”* (interview I, 2 year placement). Indeed, some fellows felt they were better able to challenge policy activities than civil servants, as their future careers were less likely to be affected by any negative reactions to such challenge. Challenging existing paradigms is not one of the activities generally recognised under knowledge brokerage functions (e.g. Turnhout *et al.* 2013) and may reflect the special nature of policy placements.

Achieving this balance between providing independence in the knowledge brokerage, but at the same time recognising the limits within which that function could be performed was a challenge recognised by several respondents and eloquently expressed by one:

*“if an academic that is new, goes into a work environment...it can just polarise itself into two areas...At one end the academic becomes stubborn, doesn’t want to change, thinks it is a threat to the way he thinks...On the other end, the academic completely becomes subservient to the culture, listens to the client, does everything the client says, gets overloaded. Tries his best to please and loses a lot of the intellectual autonomy and intellectual push”* (interview D, 6 month senior placement).

Similarly, academics could be challenged to change their way of thinking, and in some cases fellows reported that they had changed the direction of their research as a result of the placement. Thus fellows could have roles in questioning both the processes in policy but also challenging themselves and

academic colleagues on how to change their research to make it more relevant. This provides evidence of two-way knowledge flows.

### *Knowledge brokerage activities*

Three different theoretical models of knowledge brokerage have been suggested (Ward *et al.* 2009): knowledge management, linkage and exchange, and capacity building. Although concurrent use of all three models is viewed as a weakness by Ward *et al.* (2009), we consider their use concurrently as a strength, reflecting the flexibility that is required of knowledge brokers. We found activities within each of the three models among our placements.

#### *i) Knowledge Management*

Knowledge management activities were most clearly apparent in dealing with instrumental knowledge (Amara *et al.* 2004, Nutley *et al.* 2007:36). Instrumental knowledge (knowledge linked with a specific decision or concrete operation) exchange was important. Examples included interpreting existing research evidence and pulling out key policy messages from this evidence, making use of existing government datasets that were underexploited, and contributing specific expertise to a policy review process.

Academics viewed themselves as having strengths in in-depth knowledge which allowed them to place research evidence in context, to spot complex links identifying potential future problems, to grasp the limitations of the evidence available, and to appreciate the different research methods that exist. In this way, the fellows introduced their own knowledge into the policy sphere. Fellows identified a number of constraints faced by the policy community in obtaining evidence, as summarised in table 2. [insert table 2 around here]

#### *ii) Linkage and Exchange*

The emphasis of linkage and exchange in knowledge brokerage is on involving decision makers in the research process (Ward *et al.* 2009). Policy placements effectively reverse this relationship by seeking to include researchers in the policy process. In the case of placement fellows, the user engagement aspect is more complex. When a policy placement position is advertised, this can be in the form of a specified piece of research, in which case the research question is pre-determined by the policy user, but more often there is less clarity as to the role of the policy placement, with a broad area of work indicated within which the placement is to be embedded.

Although in the short-term, the ability to engage with policy users to ascertain future research directions is limited, the evidence suggested that a general awareness of policy frameworks did develop as a result of the placements, which in the longer-term can be helpful in targeting research more directly to policy relevant areas. More specifically, one respondent identified how they are now able to locate the department's own analysis of its future research needs, which although often publicly available, in practice can be difficult to locate. Here the knowledge brokerage was not about facilitating users to identify their research needs but rather facilitating researchers' access to the users' own evaluation of their research needs.

#### *iii) Capacity building*

Capacity building typically seeks to address shortcomings in ability of decision makers to use research evidence (Ward *et al.* 2009). Capacity building can be viewed as a one-directional process, with academics building the capacity of policy makers. While we found examples of this (e.g. introducing



new research methods), the placement fellows also built up their own capacity from the policy environment, presenting two-way capacity building activities.

Fellows regarded practical skills learned from placements as important. Some developed enhanced skills for presenting both information and themselves e.g. *“the way they like information to be presented, how to write reports so ... people listen to it...the types of data they want, how to speak, how to present yourself, how to dress”* (interview E, 6 month placement). A number of fellows highlighted tacit benefits like increased confidence or more transferable skills such as dealing with a range of different stakeholders. The value of developing skills in writing for different audiences was strongly emphasised (recognised elsewhere e.g. Brownson *et al.* 2006, Clark & Holmes 2010). Respondents spoke about their improved understanding of the language and written communication requirements, to convey the most important parts understandably for non-experts. Many fellows also learned more about the need to identify why policy makers should care about the evidence being presented.

Although learning these skills could be considered as knowledge management, their wider dissemination inherent in many placements reflect capacity building activities. Academic dissemination mechanisms included running seminars for academic colleagues, introducing this knowledge into undergraduate and postgraduate teaching, and providing advice and contacts for academic colleagues. For the policy world, some academic fellows in our sample gave internal briefings, workshops and presentations while on placement, on an *ad hoc* basis or as part of existing seminar programmes. Informal meetings and conversations with policy makers were also regarded as valuable opportunities for dissemination.

### **Role ambiguity and career trajectories**

In terms of achieving effective knowledge brokerage, the context and the internal role of the placement fellow was important. Some fellows tended to be sucked into the day-to-day activities of the department, whether due to staff shortages or the nature of the placement. This type of positioning made it difficult to undertake knowledge brokerage activities. For example one respondent noted *“I was just one of them, I wasn’t somebody that was, you know, an academic that was supposed to be bridging the gap, if you like, or doing some sort of knowledge transfer”* (interview B, 9 month placement). Avoiding becoming just another employee was particularly challenging where the placement was undefined. The overall effect was that the fellow excessively emphasised the policy maker part of their role (Chew & Martin 2013).

Some of the placements were specifically focused on improving the evidence-base for policy by improving the evaluation of the quality of evidence. In those situations fellows could perceive their role to be that of an independent, neutral and knowledgeable person identifying better practice in evidence gathering. Even when asked to undertake an apparent honest broker role by reviewing literature, the academic’s professional role could be challenged. In one case, a fellow refused to undertake a review because the subject was unfamiliar and the timescale was short. In this way the fellow maintained their academic credibility and independence.

Unlike the professional knowledge brokers identified by Knight & Lightowler (2010) and Chew & Martin (2013) the role of the temporary placement fellows is much less ambiguous. They continue to be part of the research community while at the same time embedded in the policy environment. But there are still challenges. Fellowships involve an investment of time. This is best viewed as a speculative investment as there may be no pre-defined outputs. Participants in this research suggested that taking time out is less risky for early-stage and well-established academics. Mid-career individuals may find a fellowship more difficult or impossible, as an absence from academe will impact too much on their

publication record. It was not possible to verify whether these worries were perceived or real career impacts. In at least two instances fellows said they had gained lectureships in part due to the work they had undertaken during the placement. Other career-related factors included academic colleagues failing to recognise the value of a placement, and viewing placements as something that only less able academics undertook. However, in other cases, academic departments were very supportive.

Academic fellows were rarely fully aware of any impact they had made on policy. This was not only frustrating but likely to cause problems with any subsequent assessment of academic achievements. Fellows recognised that their research was unlikely to result in a direct policy or statutory outcome, but they needed to be able to demonstrate that policymakers had considered their input. To create 'impact' as defined by the Research Excellence Framework, they also need to be able to produce a high quality academic publication that could be linked to the policy impact. Publishing the output from a placement was problematic for some respondents, due to the non-specific nature of the work undertaken, or in other cases, the sensitive nature of the work.

## **Discussion**

In recent years the UK research community has come under increasing pressure for research to make greater impact on knowledge users and wider society. Success partly entails identifying the proposed beneficiaries of the research and having a credible plan for engaging with them but questions remain as to how to better implement knowledge brokering for sustainability research (Hering 2016). Policy placements which place academics in policy departments are one potential mechanism to facilitate this type of engagement.

We examined whether placement fellowships offer an effective means of knowledge brokerage between academia and policy, particularly in the area of SD. We were able to identify examples where individual fellowships successfully contributed instrumental knowledge as well as conceptual knowledge, but given the range of fellowship contexts, these forms of knowledge brokerage were highly situation-dependent. Measuring 'success' in knowledge brokerage proved challenging (Bornbaum *et al.* 2015). Although we sought both placement and host perceptions of success, we were unable to relate them to the same placement, nor were we able to quantify them in any way.

We found evidence that placements enabled a greater understanding of the different cultures and drivers in academe and policy which could, in turn, improve relationships between fellows and their hosts. We found examples of academics surprised that policy was set by governments not civil servants, and policy makers surprised that academics published because the work was suitable for a highly regarded journal, rather than for policy relevance. Overcoming these cultural factors was important to set the context within which fellows could gain the necessary credibility (Levina & Vaast 2005).

Knowledge-exchange does not simply depend on the supply of knowledge, demand for knowledge and linkage through some kind of knowledge brokerage activity, but also on the capacity of the policy makers to absorb research knowledge to inform policy (Hanney *et al.* 2010). As well as general resistance to reframing the policy questions identified from our research, Owens (2005) emphasises the critical role that the receptivity of the policy community plays, noting that often relevant knowledge may lie unused until events highlight the need for that research. Given that policy placements are often designed by the policy community, they are more likely to be timely than knowledge emerging from the academic research and funding cycles.

The interdisciplinary nature of much SD research provides additional challenges. Many of our interviewees worked singly in host organisations. By themselves individual fellows may not be suitably experienced or qualified to provide and interpret interdisciplinary research, although SD academics may naturally develop such skills through exposure to the subject's complexity. Academics and their disciplines can vary in their capability to engage policy. For example, economists in many cases readily find anchorage with policy makers, because economic impacts are often evaluated in policy work, especially where trade is concerned. Different policy departments may value different types of knowledge and knowledge presentation, and may or may not have internal capacity for handling specific forms of knowledge. Some departments employ internal evidence specialists, others do not, and this can also influence knowledge brokerage mechanisms.

The assumption that placement fellows could be honest brokers of the policy options that arise from an examination of relevant evidence (Pielke 2007), seems to follow from the wider advocacy of knowledge exchange as an inherent good. In Pielke's terms, an 'honest broker' may be contrasted with an 'advocate'. The temptation towards policy advocacy may be stronger in some fields than others. Odenbaugh (2003) for example asserts that advocacy is a common feature of conservation biology. This temptation can be particularly strong in the area of SD, where knowledge can engender normative commitments to particular courses of action that make remaining an honest broker challenging.

On the other hand, the efficacy of any attempt to inform and influence policy is partly determined by the contextual conditions in which the influencing takes place, including the actors' own beliefs and the degree of polarization that already pervades the communities involved with the issue (Contandriopoulos *et al.* 2010). These considerations may not find ready anchorage in scientific communities strongly influenced by pre-defined conceptions of the meaning of scientific quality and less tuned into the factors that can delay the impact of scientific input. Academics are not always able to see the value in contextualising their work (Golden-Biddle *et al.*, 2003). This could be viewed as the opposite side of striving to ensure 'scientific independence', in that legitimate attempts to protect independent thinking can unwittingly produce academics that are located largely outside the space where the action is, tentatively trying to look in. There is a difference between being independent and being left 'out of the loop'.

We suggest several tensions operating within placements. Policy makers are not always able to make use of challenges to their perspectives and fellows who attempt to do so at an unsuitable time may impede knowledge brokerage. However, it is difficult for an academic researcher to achieve the right understanding of when it is appropriate to challenge the prevailing paradigm and when it is not helpful to do so. Academics may struggle to navigate an appropriate path between becoming subservient to current policy thinking and losing their independence, and using the placement to contribute objectively to a particular policy agenda.

We argue that the mere proximity of academic and policy actors cannot be assumed to establish a ready-made pathway to impact and that acquiring process knowledge is often a principle component of the social learning leading to effective knowledge exchange. Realising impacts may also depend on the extent to which placement fellows interact with the most relevant decision-makers; we found that those opportunities varied from situation to situation. This implies there may be a need for further knowledge-brokerage activities within the department. The fellow may or may not be the most appropriate person to undertake this further activity. In some cases our interviewees were able to do so, often because their placement enabled them to interact at a high policy level. Where a department employs internal evidence specialists or scientists, a placement fellow may be directed to work more closely with them than with policymakers and will rely on the internal evidence specialist to ensure the appropriate level

is reached. Fellows who merely became temporary ‘civil servants’ were least effective as knowledge brokers. The knowledge brokerage function in a placement was often ambiguous and required both flexibility on the part of the placement fellow and guidance from the policy host to be successful. This flexibility is both a strength, in that it enables the placement fellow to undertake tasks as required rather than as predetermined, but can also be a weakness, sometimes leading to lack of direction.

In this paper we have examined the processes involved in knowledge brokerage. The question remains as to the quality of that knowledge. We have assumed that each fellow has knowledge of equal value to the policy community, this of course is unlikely to be the case, particularly in the complex and often controversial issues covered by SD. The role of placement fellows, however, was mostly in terms of processing existing knowledge rather than generating new knowledge. The role of scientific expertise in advising policy has become increasingly subject to calls for democratization and including stakeholder knowledge to take into account the complexity of issues in sustainable development (e.g. Lang *et al.* 2012, Cornell *et al.* 2013, Hedlund-de-Witt 2014). Fellows’ knowledge-base may be informed by such stakeholder engagement, as may the policy makers’ understanding of issues. We found examples of fellows who were able to extend their stakeholder networks through their placement activities; contacts which they were subsequently able to incorporate into their later academic work.

Notable challenges exist for academic fellows, who need to maintain a publication record and a presence in academia during a placement. Conversely, the increasing emphasis on research impact in UK academe and the attraction of being able to ‘influence the influencers’ or even ‘speak truth to power’ makes such placements attractive. For the policy world, maintaining an up-to date evidence base can be challenging under severe time pressures and often with limited access to relevant knowledge. Having an academic ‘on tap’ to help navigate and interpret available evidence is an advantage.

Researching policy placements is challenging given the small number of such placements, their idiosyncratic nature and the confidential nature of UK policy making. We have made a tentative start to researching this arena but much remains unexamined. Further research is needed on the policy host perspective and measuring the success of knowledge brokerage. To what extent do placement fellowships improve access to scientific evidence (Cvitanovic *et al.* 2015) and increase scientific capability amongst policy makers? Attempts to review the efficacy of knowledge exchange mechanisms are often limited by low numbers of published studies (Bornbaum *et al.* 2015). In-depth, ethnographic case studies of placements would provide detailed understandings of how the competence for boundary spanning in knowledge brokerage emerges in practice (Levina & Vaast 2005) including how the social relationships necessary for two-way knowledge flow are negotiated (Currie & White 2012). Is it possible to develop clear intervention plans, as found in health settings (Armstrong *et al.* 2013) and what is the extent of individual contact necessary for effective knowledge brokerage (Dobbins *et al.* 2009) and what role does trust play? Longitudinal studies of former fellow career trajectories would help discern whether the expected career disadvantage materialises, or are the circumstances under which the placement experience proves to be a career advantage? Furthermore, there is room to examine in detail the way in which placement fellows with different expertise contribute to the SD challenges of dealing with uncertainty, plurality of values and perspectives, and social network analysis could unravel the extent of the stakeholder base taken into account by placements (Sprujit *et al.* 2014).

We conclude by arguing that in the specific context of short-term policy placements, social relationships and cultural understandings are key to achieving a condition within which knowledge brokerage can most effectively be conducted. Academics who are outsiders to the policy process require to become sufficient insiders to be credible, in order to be effective in bringing an outsiders perspective

into play. The academic outsiders need to become policy insiders in order to bring in an outsider's perspective into the policy process.

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## **Notes**

<sup>1</sup>The UK Research Excellence Framework <http://www.ref.ac.uk/pubs/201401/>

<sup>2</sup> The Centre for Science and Policy at Cambridge creates policy to academia fellowships <http://www.csap.cam.ac.uk/>

<sup>3</sup> The Natural Environment Research Council (NERC) placement scheme puts academia into government, <http://www.nerc.ac.uk/funding/available/schemes/placements/>

<sup>4</sup> The Rural Economy and Land Use (Relu) Programme used work-shadowing extensively as a means of improving knowledge exchange <http://www.relu.ac.uk/funding/WorkShadowsVisitingFellows/workshadowing.htm>

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## **Table 1 Summary of instrumental, conceptual and process knowledge**



Instrumental knowledge	Conceptual knowledge	Process knowledge
<ul style="list-style-type: none"> <li>• Interpreting and pulling out key messages from existing research evidence; providing frameworks for addressing issues</li> <li>• Assessing the quality of existing research evidence, the limitations of the existing research base and complex links that might lead to unexpected problems</li> <li>• Enhancing access to academic research for policy makers through informal, personal conduits and wider networks of academics</li> <li>• Providing external, neutral analysis e.g. of effectiveness of policy, results of consultation etc.</li> <li>• Academics obtaining access to in-house knowledge or data</li> </ul>	<ul style="list-style-type: none"> <li>• Providing conceptual understanding of a new area of interest to policy</li> <li>• Suggesting alternative conceptualisations of the policy question</li> <li>• Challenging existing paradigms in both academia and policy</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding how decisions are made in the policy process, and the time constraints involved</li> <li>• More realistic appreciation of the role that evidence plays in policy</li> <li>• Better understanding of what is policy relevant research</li> <li>• Insights into the different motivators for the two sectors academic and policy, leading to improved communication</li> <li>• How to present and communicate academic information to a policy context.</li> </ul>

**Table 2 Evidence constraints faced by policy community**

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| <ul style="list-style-type: none"> <li>• Time constraints, lack of time to read academic journals</li> <li>• Insufficient funding to access journals</li> <li>• Academic research not being appropriate for the question being addressed</li> <li>• Not knowing the appropriate academic to contact to ask about evidence</li> <li>• Reluctance of scientists to put certainty in documents. Publishing evidence that is contradictory.</li> </ul> | <ul style="list-style-type: none"> <li>• Language differences</li> <li>• Lack of access to one-page summaries of academic papers which also indicate why the policy maker should care about the research</li> <li>• Short-timescales for making decisions</li> <li>• Need to make decisions, irrespective of lack of evidence.</li> <li>• Difficulty in accessing and making use of academic evidence</li> </ul> | <ul style="list-style-type: none"> <li>• Rapid movement around posts means they lost their specialist skills and became generalists</li> </ul> |
|--|--|--|